What is claimed is:

1. An isolated polynucleotide comprising a TRPM4 (transient receptor potential-melastatin 4) promoter polynucleotide, wherein the TRPM4 promoter polynucleotide is at least 70% identical to SEQ ID NO: 1 over a stretch of at least 70 nucleotides and confers prostate tumor-specific transcription when operably linked to a heterologous polynucleotide.

2. The polynucleotide of claim 1, wherein the polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 3, and SEQ ID NO: 4.

3. The polynucleotide of claim 1, wherein the TRPM4 promoter polynucleotide comprises TRPM4 transcription initiation elements.

4. An isolated polynucleotide comprising the TRPM4 promoter polynucleotide of claim 1 operably linked to a heterologous polynucleotide.

5. The polynucleotide of claim 4, wherein the heterologous polynucleotide encodes a polypeptide.

6. The polynucleotide of claim 5, wherein the polypeptide is selected from the group consisting of a toxin, a prodrug-converting enzyme, a tumor suppressor, a sensitizing agent, an apoptotic factor, an angiogenesis inhibitor, a cytokine, and an immunogenic antigen.

7. The polynucleotide of claim 4, wherein the heterologous polynucleotide is selected from the group consisting of an antisense polynucleotide and a catalytic polynucleotide.

8. A viral vector comprising a TRPM4 promoter polynucleotide of claim 1.

9. The viral vector of claim 8, wherein the viral vector is selected from the group consisting of a retroviral vector, an adeno-associated viral vector, and an adenoviral vector.

10. The viral vector of claim 8, wherein the TRPM4 promoter polynucleotide is operably linked to a heterologous polynucleotide.

11. The viral vector of claim 10, wherein the heterologous polynucleotide encodes a polypeptide.

12. The viral vector of claim 11, wherein the polypeptide is selected from the group consisting of a toxin, a prodrug-converting enzyme, a tumor suppressor, a sensitizing agent, an apoptotic factor, an angiogenesis inhibitor, a cytokine, and an immunogenic antigen.

13. The viral vector of claim 10, wherein the polynucleotide is selected from the group consisting of an antisense polynucleotide and a catalytic polynucleotide.

14. An adenovirus vector comprising a TRPM4 promoter polynucleotide of claim 1 operably linked to a polynucleotide encoding an adenovirus polypeptide, wherein the adenovirus polypeptide is essential for adenoviral propagation.

15. The adenovirus vector of claim 14, wherein the polynucleotide encoding the adenovirus polypeptide is selected from the group consisting of the adenovirus E1a, E1b, E2, and E4 genes.

16. The adenovirus vector of claim 14, wherein the adenovirus vector further comprises a polynucleotide selected from the group consisting of an antisense polynucleotide and a catalytic polynucleotide.

17. The adenovirus vector of claim 14, wherein the adenovirus vector further comprises a polynucleotide encoding a polypeptide selected from the group consisting of a toxin, a prodrug-converting enzyme, a tumor suppressor, a sensitizing agent, an apoptotic factor, an angiogenesis inhibitor, a cytokine, and an immunogenic antigen.

18. A composition comprising the adenovirus vector of claim 14 in a pharmaceutically acceptable carrier.

19. A method of expressing a heterologous polynucleotide in a prostate cell, the method comprising transforming the cell with the polynucleotide of claim 4, wherein the

heterologous polynucleotide is expressed in the prostate cell.

20. The method of claim 19, wherein the heterologous polynucleotide is selected from the group consisting of an antisense polynucleotide and a catalytic polynucleotide.

21. The method of claim 19, wherein the heterologous polynucleotide encodes a polypeptide selected from the group consisting of a toxin, a prodrug-converting enzyme, a tumor suppressor, a sensitizing agent, an apoptotic factor, an angiogenesis inhibitor, a cytokine, and an immunogenic antigen.